



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,238	12/30/2003	Long-Sheng Liao	B-5342 621590-4	3885
7590 Richard P. Berg, Esq. c/o LADAS & PARRY Suite 2100 5670 Wilshire Boulevard Los Angeles, CA 90036-5679			EXAMINER TSAI, H JEY	
			ART UNIT 2812	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/19/2006	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/751,238	<b>Applicant(s)</b> LIAO ET AL.	
	<b>Examiner</b> H.Jey Tsai	<b>Art Unit</b> 2812	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
     4a) Of the above claim(s) 9-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Election/Restriction***

Applicant's election with traverse of group I invention, claims 1-8 in Paper filed on Sept. 29, 2006 is acknowledged.

The traversal is on the ground(s) that Examiner has misclassified the claims of group II invention. This is not found persuasive because method and product are statutorily distinct categories of invention, and the particular method claimed is distinct from the particular product claimed because there is an alternative method of making the device. Therefore, there is no reason why a search for product must include a search for the method as well. The existence of an alternative method of making the device, as well as the different classification of two inventions, provide evidence of burden on the examiner in examining both inventions.

Distinctness between a process of making and the product made is shown if "the product as claimed can be made by another and materially different process." MPEP § 806.05(f). In the restriction requirement, the examiner set forth several "materially different processes" by which the claimed product could be made.

The requirement is still deemed proper and is therefore made FINAL.

Claims 9-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected with traverse, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on Sept. 29, 2006.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohr et al. 6,073,464. in view of skill level of one of ordinary person in the art.

Bohr et al. discloses a system of automatic beam energy control, comprising:  
a substrate holding apparatus TAB holding a substrate PA, fig. 2, col. 5, lines 36-67,  
a measurement apparatus (ellipsometer) EL, measuring thickness and hydrogen content (surface physico-chemical characteristics, including hydrogen content, thickness etc, see col. 8, line 64 to col. 9, line 18) of the substrate, col. 5, lines 10-36,  
a comparing apparatus GES1, GES2 (a microcomputer having memory to store process data, such as adjustment data, target data, determining laser beam energy from a look-up table etc, see col. 6, lines 14-29, col. 7, lines 1-10, col. 11, lines 46-49), providing a database further comprising critical hydrogen content limits and appropriate beam energy levels for substrates of different thicknesses, allowing determination of whether a measured hydrogen content value exceeds a critical hydrogen content limit, providing an appropriate beam energy level accordingly, figs. 2, 4, col. 11, line 4 to col. 12, line 30, col. 9, lines 30-60,

a energy beam apparatus LA, delivering beam energy to the substrate  
accordingly, col. 11, lines 50-51, col. 12, lines 1-29,

regarding claim 2, wherein the measurement apparatus utilizes ellipsometry EL,  
figs. 1-2, col. 5, lines 37-40, col. 8, line 64 to col. 9, line 18,

regarding claim 3, wherein the comparing apparatus issues a  
warning or alarm when hydrogen content exceeds a critical hydrogen content limit, col.  
8, lines 46-63,

regarding claim 4, wherein the comparing apparatus GES1, GES2 instructs the  
measurement apparatus to measure thickness when the hydrogen content does not  
exceed the critical hydrogen content limit, fig. 4,

Regarding claim 6, wherein thickness is calculated in accordance with a  
refractive (optical) index of the substrate, col. 9, lines 8-18,

Regarding claim 7, wherein the substrate comprises amorphous Silicon, col. 9,  
lines 8-18,

Regarding claim 8, wherein the database comprises  
appropriate (adjusting) beam energy levels required by different thicknesses of  
amorphous silicon for reconstitution into crystal silicon, col. 11, lines 10-12, col. 12, lines  
23-29.

The difference between the references applied above and the instant claim(s) is:  
Boher et al. teaches an energy beam apparatus having an ellipsometer apparatus for  
measuring thickness and hydrogen content of substrate, a comparator apparatus of a  
microcomputer for comparing and as a controller of the system and a laser beam

Art Unit: 2812

apparatus having memory to store process data, such as adjustment data, target data, measuring the thickness and hydrogen contents, determining laser beam energy from a look-up table, lowering the laser beam energy to prevent the hydrogen explosion when hydrogen content reach the critical limit and firing the laser beam accordingly, etc. but Boher does not specifically teaches a database further comprising critical hydrogen content limits and appropriate beam energy levels for substrates of different thicknesses, allowing determination of whether a measured hydrogen content value exceeds a critical hydrogen content limit. However, Boher teaches at col. 6, lines 14-29, col. 7, lines 1-10, col. 11, lines 46-51, col. 8, line 64 to col. 9, line 18, having memory to store process data, such as adjustment data, target data, measuring the thickness and hydrogen contents, determining laser beam energy from a look-up table, lowering the laser beam energy to prevent the hydrogen explosion when hydrogen content reach the critical limit and firing the laser beam accordingly, etc. Hence, It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that Boher et al. references' teachings of stored process data, adjustment data, target data, measuring the thickness and hydrogen contents, determining laser beam energy from a look-up table, lowering the laser beam energy to prevent the hydrogen explosion when hydrogen content reach the critical limit and firing the laser beam accordingly is equivalent to a database comprising critical hydrogen content limits and appropriate beam energy levels for substrates of different thicknesses, allowing determination of whether a measured hydrogen content value

exceeds a critical hydrogen content limit or just simply includes the critical data etc. in the look up table or adjustment data or target data, etc.

And, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987), see MPEP §2114 [R1].

And, Since Boher et al. teaches an apparatus having ellipsometer measuring apparatus for measuring thickness and hydrogen content of substrate, a comparator apparatus of a microcomputer as comparing/controller apparatus having capability of storing the process data, adjustment data, target data, measuring the thickness and hydrogen contents, determining laser beam energy from a look-up table, lowering the laser beam energy to prevent the hydrogen explosion when hydrogen content reach the critical limit and firing the laser beam accordingly, hence, the patentable weight is not given to the intended use of method of operating and making the apparatus. The method of operating and making an apparatus is not germane to the issue of patentability of the apparatus itself. Therefore this description does not carry any patentable weight. See MPEP §§ 2112-2115.

Claim 3 is rejected under 35 U.S.C 103 as being unpatentable over Boher et al. as applied to claims 1-2, 6, 7-8 above, and further in view of Takamatsu et al. 2001/0008803 and skill level of one of ordinary person in the art.

The difference between the references applied above and the instant claim(s) is: Boher et al. teaches a comparing apparatus a microcomputer having memory to store process data, such as hydrogen content, adjustment data, target data, determining laser beam energy from a look-up table etc. and firing the laser beam but does not teach a warning or alarm. However, Takamatsu teaches at para. 6, installing an alarm system in the equipment. And, since Boher et al. teaches the system of energy beam control includes a microcomputer to automatic control and monitor the entire operation of the system. Since, every computer has voice and sound capability, hence, it would be obvious to add a warning or alarm in the computer by inserting an instruction in computer program so that microcomputer would beep or voice warning when hydrogen reach the upper limit of the process limitation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings by installing an alarm in the Apparatus for laser beam control or just program the microcomputer to beep as taught by Takamatsu et al. because alarm or beeping sound from computer can alert operator about the hydrogen upper limit so that operation can make safety precautions.



Claim 4 is rejected under 35 U.S.C 103 as being unpatentable over Boher et al. as applied to claims 1-2, 6, 7-8 above, and further in view of skill level of one of ordinary person in the art.

The difference between the references applied above and the instant claim(s) is: Boher et al. teaches an energy beam apparatus having ellipsometer measuring apparatus for measuring thickness and hydrogen content of substrate, a comparator apparatus of a microcomputer for comparing and as a controller of the system and a laser beam apparatus but Boher does not specifically teaches instructing the measurement apparatus to measure thickness when the hydrogen content does not exceed the critical hydrogen content limit. However, Boher teaches using ellipsometer to measure hydrogen content and thickness and ellipsometer is control by a microcomputer (comparing/controller apparatus), hence, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings by programming the microcomputer to measure the thickness when hydrogen content does not exceed the critical hydrogen content limit because there are too many tasks to perform for microcomputer such as lowering the laser beam energy to prevent the hydrogen explosion when hydrogen content reach the critical limit. And, Since, Boher et al. teaches using an ellipsometer to measure hydrogen content and thickness of substrate in conjunction with a microcomputer as a controller and comparator, hence, the patentable weight is not given to the method of how to instruct the ellipsometer apparatus. The method of operating an apparatus is not germane to

the issue of patentability of the apparatus itself. Therefore this description does not carry any patentable weight. See MPEP §§ 2112-2115.

Claim 5 is rejected under 35 U.S.C 103 as being unpatentable over Boher et al. as applied to claims 1-2, 6, 7-8 above, and further in view of Admitter prior art of Amorphous and Liquid semiconductor, by Tauc J, 1974 in page 5-6 of instant specification or Matsuyama et al. 5,252,142.

The difference between the references applied above and the instant claim(s) is: Boher et al. teaches an apparatus having ellipsometer measuring apparatus for measuring thickness and hydrogen content of substrate, comparator, a microcomputer as comparing/controller apparatus and a laser beam apparatus but Boher does not teaches calculating hydrogen content with the relationship of light extinction coefficient and a bandgap of the substrate. However, Tauc J, teaches a formula for calculating hydrogen by using the relationship of light extinction coefficient and a bandgap of the substrate. Matsuyama et al. teaches at col. 13, lines 10-13, col. 17, lines 15-25, the hydrogen is related to the bandgap of the substrate and light extinction coefficient.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings by using Tauc J's formula or Matsuyama et al.'s teaching to calculate the hydrogen content.

Since, Boher et al. teaches an energy beam apparatus including an ellipsometer for measuring hydrogen content, hence, the patentable weight is not given to the

Art Unit: 2812

method of making the ellipsometer apparatus. The method of making an apparatus is not germane to the issue of patentability of the apparatus itself. Therefore this description does not carry any patentable weight. See MPEP §§ 2112-2115.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. Jey Tsai whose telephone number is (571) 272-1684. The examiner can normally be reached on from 7:00 Am to 4:00 Pm., Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt can be reached on (571) 272-1873.

The fax phone number for this Group is 571-273-8300.

hjt

12/7/2006



H. Jey Tsai  
Primary Examiner  
Patent Examining Group 2800